

plenty of other money it could spend on alleviating world poverty. Think of what we spend on cigarettes, gambling, pet food, and wars in Iraq. More importantly, Lomborg's trivialising of global climate change shows ignorance about the profound ecological and social implications of global environmental changes. His statement that "global warming is not expected to have a severe impact on human welfare as a whole" suggests that he has not read the wide ranging reports of the Intergovernmental Panel on Climate Change.⁶ Or is this another example of his selectivity?

He is certainly selective in quoting just one, conservative, estimation of the economic effects of global warming. There is a huge and divergent literature on this topic. Likewise, belittling the Kyoto protocol is mischievous. Kyoto is widely understood to be a first, small, symbolic step. Indeed, its acknowledged marginal impact on global warming highlights the need for more radical, and politically challenging, cuts in emissions over coming decades.

What is human welfare?

Lomborg also takes a narrow view of human welfare. Yes, material comforts, money, consumer freedoms, and increased life expectancy are very desirable, although we recognise increasingly that their attainment must be compatible with sustainable develop-

ment. He concedes that "wealth might not always make you happier" but neglects other important dimensions of welfare. These include spiritual experience, peace of mind, community dynamics, and opportunities for self expression.

Lomborg has compiled much useful information showing that, within the conventional agenda of environmental quality and human material wellbeing, we have made some great advances. He fails to understand the concerns of the systemic optimists, who believe that past economic practices, technology choices, and exploitation of the ecosystem are ecologically and socially unsustainable.

Competing interests: None declared.

- 1 Schneider S, Holdren JP, Bongaarts J, Lovejoy T. Misleading math about the earth (four essays). *Sci Am* 2001;286(1):59-70.
- 2 Vitousek PM, Mooney HA, Lubchenco J, Melillo J. Human domination of earth's ecosystems. *Science* 1997;277:494-9.
- 3 McMichael AJ. *Human frontiers, environments and disease: past patterns, uncertain futures*. Cambridge: Cambridge University Press, 2001.
- 4 McMichael AJ. The biosphere, health and "sustainability." *Science* 2002;297:1093.
- 5 Eckersley R. Bjorn Lomborg's "The Skeptical Environmentalist": a socio-cultural perspective. *Global Change and Human Health* 2002;3:55-7.
- 6 Intergovernmental Panel on Climate Change. *Climate change 2001: third assessment report*. Cambridge: Cambridge University Press, 2001.
- 7 McMichael AJ, Butler CD. Global health trends, evidence for and against sustainable progress. Proceedings, IUSSP workshop "Emerging health threats: determinants of diverging trends in mortality in a changing world." Rostock, Germany, June 2002. www.demogr.mpg.de (accessed 16 Dec 2002).

Time and tide wait for no man

David Shearman

Global warming presents a new hazard to human health. Recognising the predominant human mechanisms for our failure to address this problem may help in formulating strategies for action

Department of Geography and Environmental Studies, University of Adelaide, Adelaide, SA, Australia

David Shearman
emeritus professor of medicine

Correspondence to:
D Shearman,
2 Reynolds Drive,
Crafrers, SA 5152,
Australia
mountlofty@ozemail.com.au

BMJ 2002;325:1466-8

Humanity is making little progress in solving the global issues of war, famine, poverty, environmental destruction, population overload, and climate change that increasingly threaten its wellbeing, health, and survival. The national and international responses to all these major problems are totally inadequate, and the medical profession should be active in seeking remedies.

While all these global issues seem insoluble in their scale and complexity, global warming presents a particular and unfamiliar hazard to human health. The United States, with 4% of the world's population, produces a quarter of its greenhouse gases. The *BMJ* has addressed the inadequacies of the US president's response to global warming.¹ Ill health due to climate change is likely to arise both directly (such as via thermal stress) and through complex mechanisms that disturb ecological systems, many of which are already stressed by pollution, bio-invasion, and loss of resilience due to altered biodiversity. For example, the impacts of climate change on plant physiology and agroecosystem functioning may interact with soil degradation to decrease the yields of crops needed to feed a growing human population. Global warming may thus impair health by reductions in nutrition,

Summary points

Climate change presents a unique threat to humanity because it is difficult to comprehend responsibility beyond our existing descendants

Our psychological mechanisms and economic ideology also preclude effective action

Doctors have the skill and responsibility to help solve global issues

The medical profession must work to influence governments and their leaders by personal interaction and persuasion

economic activity, and habitable locations and increases in infectious diseases. Extreme weather events and a changing distribution of precipitation could cause physical disasters, exacerbate conflicts, and augment the flow of environmental refugees as communities compete for diminishing natural resources.

Our inability to make progress in addressing global warming can be examined by defining the predominant human mechanisms for this failure. Their recognition may facilitate preventive strategies.

“Darwinian” mechanisms

Edward Wilson believes that humanity’s inability to think long term relates to the brain being “a hard wired part of our Palaeolithic heritage.”² Over hundreds of millennia, our forebears adapted to local environmental conditions. Natural selection puts a premium on thinking short term and having an emotional commitment to immediate living space and to a limited and cooperative group of relatives and friends. As a result, Wilson states, “We are innately inclined to ignore any distant possibility not yet requiring examination.” Global warming is seen as a distant possibility. Families cannot comprehend responsibility beyond their grandchildren.

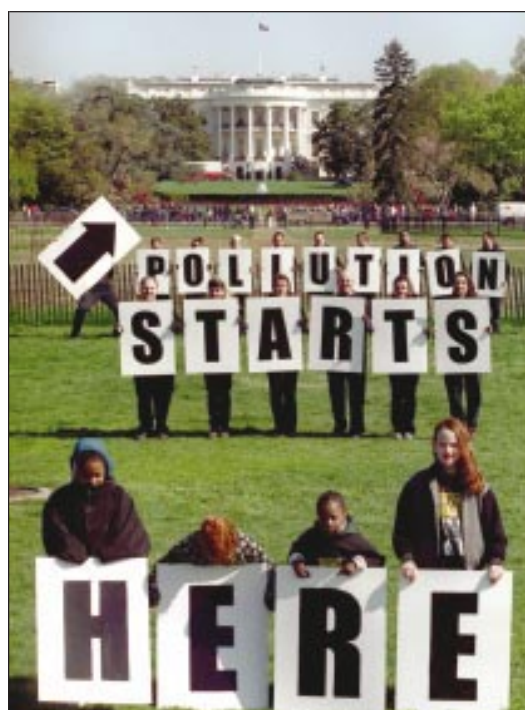
Wilson’s thoughts explain why environmentalism begins at home, via concern over the neighbourhood factory chimney or forest destruction. These local threats to our wellbeing often lead to activism, marches, and lobbying. Marches to alleviate an intangible global warming are unlikely.

Psychological mechanisms

When faced with a problem beyond the limited space around us, and when it involves distant individuals and races, the defensive mechanism of denial is activated. This has been studied in relation to human rights, poverty, and famine.³ Denial often relates to the enormity of the problem, because one person can do little about it. An individual can accept the scientific evidence but deny responsibility. Indeed, the provision of more information may increase denial and lead to antagonism. More images of malnourished children and requests for donations are ignored, or we blame others for creating the problem. Denial is present in the language used to describe the problem: mass murder becomes “cleansing.”

All these mechanisms are recognisable in the responses to global warming. The problem is seen as enormous and beyond comprehension. The contentious Kyoto agreement proposes a meagre 5% reduction in greenhouse gas emissions, yet a reduction of 65% is necessary to avert serious climate changes.⁴ The provision of more evidence is seen as “gloom and doom” and is counterproductive. David Suzuki now writes about good news.⁵ The expected drowning of Pacific Islanders with tidal surges becomes “human impacts.” Such responses are widespread and, most importantly, they are prevalent in politicians and governments.

There are also particular reasons why global warming can be denied. Traditional scientific methods attempt to explore questions by means of experiments that provide reproducible results. By contrast, the science of climate change and the reports of the Intergovernmental Panel on Climate Change are largely based on computer projections, using models validated and improved as theory and current and historical data expand.⁶ Forecasts and conclusions are therefore presented as statistical probabilities. As a result, denial mechanisms are easily boosted by the occasional scep-



Greenpeace supporters outside the White House protesting against President Bush’s stance on the environment

tic or the covert activities of the fossil fuel industries.⁷ Governments act in the face of the uncertainty of economic forecasts, but uncertainty in climate change data becomes an excuse for inaction.

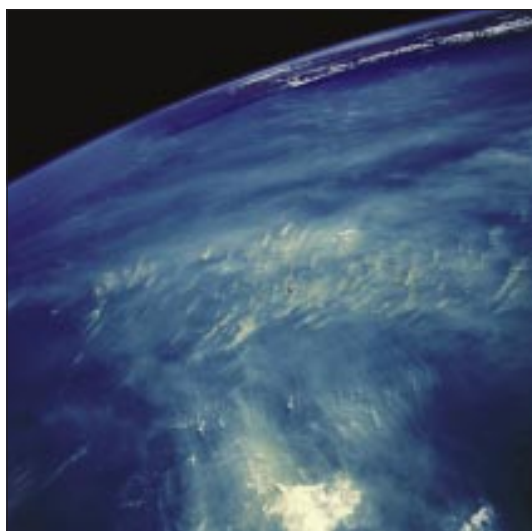
Ideological mechanisms

In the past 30 years the free market system has increasingly dominated the governance and organisation of society. In this system the creation of jobs and wealth and the amelioration of poverty and environmental problems are seen to depend solely on the steady growth of the world’s economy.⁸ However, there is increasing evidence that developing countries are suffering from the effects of this system driven by a global market.⁹ Many scientists working on global environmental problems recognise that the growth economy is incompatible with environmental sustainability. Growth creates more and more environmental problems with its consumption of natural resources.

“Growth” economics has emerged as the paramount international ideology that prevents humanity from addressing global environmental and social issues. Its proponents police it with international rules, media influence, and corporate power. Concerns are disregarded, even when they are expressed by luminaries such as Stiglitz¹⁰ or Gorbachev.¹¹ To date, commercial influences on governments, particularly those of the fossil fuel industry, have outplayed the data of thousands of scientists.

Strategies

In defining a remedial strategy for global issues that endanger health, it is useful to consider the above mechanisms. The world’s population of six billion people is expected to peak at around 9-10 billion later



The global effects of pollution can be seen from space. Here numerous smoke plumes are visible from the "slash and burn" clearance of the Amazon rain forest in western Brazil

this century. This enormous population surge underlies most of our other global problems. Yet it is possible to express some optimism. To each of us, family size is commensurate with local, addressable, "Darwinian" problems. Family size is falling because it can be influenced by education and small increases in economic wellbeing. There are no individual denial mechanisms needed, religious ideology is often ignored, and "growth" ideology and psychological factors play little part. By contrast, war is seemingly intractable because it falls into the instinctive and territorial mechanisms described by Wilson, and, further, it is fuelled by a vast expenditure on arms, a bulwark of the growth economy. Global warming is difficult to address as it confronts all three of the above mechanisms.

Doctors have the opportunity and a duty to engage with the issues of climate change and other global problems because they fall within our remit of the alleviation of human suffering. Further, we have respect and standing, and we are listened to when our motives are seen to be unselfish. The achievements of Médecins Sans Frontières and Physicians for the Prevention of Nuclear War testify to this. Yet only a tiny minority of doctors are involved. Unless our involvement increases, a world of social tension and environmental deterioration will negate many of our medical gains.

While community education should continue, with our inputs, it is unlikely to promote government action for the reasons analysed above. Our efforts would therefore be best concentrated on influencing the currently woeful leadership of the major greenhouse gas producing nations. While doctors have influenced world events by personal interaction, and can do so again, the involvement of our professional organisations and colleges has generally been perfunctory. The usual excuse is the immediacy of services, epidemics, and standards.

Collectively, we are not using our professional skill, our special combination of scientific knowledge and experience of human nature. We must help by persuading our organisations to devote time and resources to world problems that affect health. We can ask our journals to publish regularly the strategies,

progress, and reports of these organisations. We can participate by becoming members of those doctors' organisations devoted solely to these issues—for example, the International Society of Doctors for the Environment (www.isde.org). For those with little time, a subscription allows someone else to do the lobbying.

The human traits that lead to war, environmental disaster, and famine have not improved during recorded history. Our technological advances have increased exponentially over a few centuries, but our intercommunity and interracial skills have improved little. Heroic measures are needed if we are to change course: it seems nigh on impossible to abandon the growth economy for a truly sustainable one, or to redeploy the vast arms expenditure to eradicate poverty or to redistribute the world's adequate food supplies to the malnourished. As a result, those who ruminate on these issues think of measures to modify the human mind. Humanity accepts such measures already with the psychological manipulations of the advertising industry that drive the growth economy by stimulating consumerism.¹² Consumerism is reinforced by media, films, the corporate invasion of the classroom, and by governments whose taxes and policies depend on it.

With redeployment of the advertising industry's annual budget of \$435bn,¹³ we could begin to condition ourselves against the instincts of aggression and greed and enhance the prospects of a sustainable society. The frontiers of medical research may have to encompass the psychological and neuro-immunochemical manipulation of the human brain if humanity is to survive for the next few centuries. Time, tide, and climate change wait for no person.

DS is honorary secretary of Doctors for the Environment, Australia.

Funding: None.

Competing interests: None declared.

- 1 Smith R. Death through selfishness and failure of imagination *BMJ* 2001;322:690.
- 2 Wilson EO. *The future of life*. London: Little, Brown, 2002.
- 3 Cohen S. *States of denial. Knowing about atrocities and suffering*. Cambridge: Polity Press, 2001.
- 4 McMichael AJ, Powles JW. Human numbers, environment, sustainability and health. *BMJ* 1999;319:977-80.
- 5 Suzuki D, Dressel H. *Good news for a change. Hope for a troubled planet*. St Leonards: Allen and Unwin, 2002.
- 6 Intergovernmental Panel on Climate Change. *Climate change 2001. Third assessment report*. Vols 1-3. Cambridge: Cambridge University Press, 2001.
- 7 Beder SD. Corporate hijacking of the greenhouse debate. *Ecologist* 1999;29:119-22.
- 8 Shearman D, Sauer-Thompson G. *Green or gone. Health, ecology, plagues, greed and our future*. Kent Town: Wakefield Press, 1997.
- 9 Watkins K. Freed is good. *Guardian Weekly* 2002 August 15-21:21.
- 10 Stiglitz JE. *Globalisation and its discontents*. New York: WW Norton, 2002.
- 11 Gorbachev M. Business as usual is no longer an option. *Guardian Weekly* (Earth supplement) 2002 August.
- 12 Carroll J. *Ego and soul. The modern West in search of meaning*. Sydney: HarperCollinsPublishers, 1998.
- 13 Klein N. *No logo*. London: Flamingo, 2001.



... and take the brewery's commendation with a pinch of salt